

With Compliments of the Author

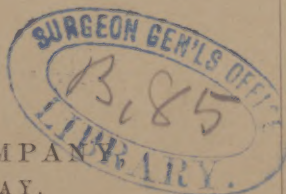
ON THE
ELECTIVE ACTION
AND
SMALL DOSES OF MEDICINES.

WITH ILLUSTRATIVE CASES.

BY
THOMAS J. MAYS, M.D.,
UPPER LEHIGH, PENNSYLVANIA.

[REPRINTED FROM THE NEW YORK MEDICAL JOURNAL, MARCH, 1879.]

NEW YORK:
D. APPLETON & COMPANY
549 & 551 BROADWAY.
1879.



APPLETONS' JOURNAL

FOR 1879.

ILLUSTRATIONS will be excluded from APPLETONS' JOURNAL hereafter, it being the purpose of the proprietors to devote the entire space to literature of a high order of excellence, by writers of acknowledged standing.

It is the growing habit of the leading minds in all countries to contribute their best intellectual work to the magazines and reviews; and, in order that APPLETONS' JOURNAL may adequately reflect the intellectual activity of the time thus expressed, it will admit to its pages a selection of the more noteworthy critical, speculative, and progressive papers that come from the pens of these writers.

Fiction will still occupy a place in the JOURNAL, and descriptive papers will appear; but large place will be given to articles bearing upon literary and art topics, to discussions of social and political progress, to papers addressed distinctly to the intellectual tastes of the public, or devoted to subjects in which the public welfare or public culture is concerned.

TERMS OF APPLETONS' JOURNAL.—Three dollars per annum, in advance, postage prepaid by the publishers, to all subscribers in the United States or Canada; or twenty-five cents per number. A Club of Four Yearly Subscriptions will entitle the sender to an extra subscription gratis; that is, five copies will be sent one year for twelve dollars.

The volumes begin January and July of each year. Subscriptions received for any length of time.

APPLETONS' JOURNAL and THE POPULAR SCIENCE MONTHLY, for one year, for seven dollars, postage prepaid (full price, eight dollars).

THE POPULAR SCIENCE MONTHLY

FOR 1879.

Conducted by E. L. and W. J. YOUNG.

Containing instructive and interesting articles and abstracts of articles, original, selected, and illustrated, from the pens of the leading scientific men of different countries;

Accounts of important scientific discoveries;

The application of science to the practical arts;

The latest views put forth concerning natural phenomena, by savants of the highest authority.

Prominent attention will also be given to those various sciences which help to a better understanding of the nature of man, to the bearings of science upon the questions of society and government, to scientific education, and to the conflicts which spring from the progressive nature of scientific knowledge.

It is an instructive and valuable monthly, and, as a consequence, is continually increasing in circulation and influence.

THE POPULAR SCIENCE MONTHLY will be enlarged, beginning with the issue for January, 1879. It is handsomely printed on clear type, and, when necessary to further convey the ideas of the writer, fully illustrated.

TERMS: Five dollars per annum; or, fifty cents per number. A Club of five will be sent to any address for twenty dollars per annum.

The volumes begin May and November of each year. Subscriptions may begin at any time.

THE POPULAR SCIENCE MONTHLY and APPLETONS' JOURNAL, together, for seven dollars per annum, postage prepaid.

D. APPLETON & CO., Publishers, 549 & 551 Broadway, New York.

ON THE
ELECTIVE ACTION
AND
SMALL DOSES OF MEDICINES.

WITH ILLUSTRATIVE CASES.

BY
THOMAS J. MAYS, M.D.,
UPPER LEHIGH, PENNSYLVANIA.

[REPRINTED FROM THE NEW YORK MEDICAL JOURNAL, MARCH, 1879.]

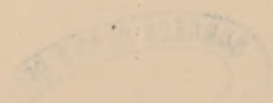


NEW YORK:
D. APPLETON & COMPANY,
549 & 551 BROADWAY.
1879.

NOTES ON THE HISTORY OF THE

REPUBLIC OF THE UNITED STATES

OF THE UNITED STATES OF AMERICA



THE UNIVERSITY OF CALIFORNIA LIBRARY
BERKELEY, CALIF.

ON THE ELECTIVE ACTION AND SMALL DOSES OF MEDICINES.

I HAVE elsewhere * pointed out that our therapeutic agents are the embodiment of forces; that when viewed from the standpoint of life they naturally divide into two great classes, viz., those which move in harmony, and those which move in discord with the vital forces; that those which move in such harmony tend to enhance the bodily forces, and that those which move in discord can be so regulated as either to promote or depress bodily activity. I have further shown in the same place that those forces which even move in concord with the bodily forces under certain circumstances will also under other conditions move adversely to the latter; but, since this paper is to be strictly devoted to a discussion of that class of therapeutic agents which are at constant warfare with the vital forces, these will receive no further special attention. By way of parenthesis I will here add that much of the preliminary matter in this article is a repetition of what I discussed in my work, to which reference has been already made.

Thus, "when two forces of equal strength meet each other from opposite directions, rest is produced, but an attacking force of comparative moderate strength will disturb the equilibrium of a force of somewhat less resistance, and cause it to move in a direction parallel to its own, to such a point where a mutual balance occurs. And although the latter tends to

* "On the Therapeutic Forces," Lindsay & Blakiston.

rebound and assume its former position, yet, by a series of such impactions, it will be forced to seek a new equilibrium in which it will remain after the attacking force has ceased to act. This phenomenon is well illustrated by the gentle gale blowing over a field of tall grain, disturbing the latter and giving to it a wave-like motion; and it is well known that a steady and continuous breeze in one direction will often cause the grain to lean in that direction, and to remain that way for some time after the disturbing force has ceased to operate. Again, it is also well known that a wind or breeze from an opposite direction will have the effect of rendering the grass straight again. But it is also true, on the other hand, that an attacking force of great strength will ultimately overthrow the resisting force altogether—this latter result varying in proportion to the relative strength of the two forces. This portion of the principle is well exemplified in the case of a cyclone or violent storm blowing across a forest. If the force of the wind is sufficiently powerful, every tree, however strong, will have to go down before it; if it is more moderate in strength the weaker only succumb, while the stronger survive.”

The operation of this law of antagonism is well witnessed in the different effects of friction on the body. “When, for example, slight and gentle friction is applied to the body, the molecular activity of that part is immediately aroused to its utmost physiological capacity; and this procedure, as is well known, is a powerful adjuvant in the treatment of disease. But when the friction is carried to excess, as it sometimes is in the case of the palmar surfaces of the laborer’s hands, where large blisters sometimes form in consequence of the handling of tools, the process assumes a pathological phase, and can no longer be considered as being within the limits of health. Now, these two widely different phenomena are the result of a process which is exactly the same in kind, differing only in degree. The organic molecular activity is accelerated in both instances; but, since rapidity of molecular motion of the body and health are not synonymous, there naturally must be a point where this activity is pushed over the bounds of health into those of disease.” Or, again, take the case of the action

of mustard on the body. A transient mustard-plaster will frequently relieve pain and infuse warmth, vigor, and life into the part, but its more protracted application will superinduce violent pain, inflammation, and vesication.

Here we observe, then, that both friction and mustard in their action on the body in small quantities are analogous "to a mild force of wind blowing across a field of tall grass." That they move in a direction contrary to that of, and come in contact with, the weaker molecular forces of the body, and motion necessarily takes place in the line of least resistance, which is in consonance with that of the attacking force, until at such a point where a momentary equilibrium is restored by the action of the bodily forces, after which motion takes place in an opposite direction. By the prolonged action of these forces a series of such oscillations or waves are produced, and in this way the bodily molecules are impelled to their former state of energy and activity; they thus acquire an additional amount of strength, which will remain even after the attacking force has subsided. But it will be observed that protracted and concentrated application of friction and of mustard will not only not infuse healthful activity, but, on the contrary, produce disease and death; and hence their operations under such conditions can be compared to the fierce wind or storm blowing across the forest producing ruin and devastation on every hand.

Thus, then, I hold that we can no longer regard our therapeutic agents as capable of producing only a single resultant; but that, like friction and mustard, they are all representatives of force which give rise to results in accordance with their quantity, and the circumstances under which they act.

The fact that cathartics, emetics, etc., manifest a preference of action on special tissues of the body is too obvious to be disputed, but I think we also have reason for believing that most, if not all, of our therapeutic agents possess this peculiar and specific acting power in a similar degree; and I have in the work above quoted expressed my faith that, if we look upon our medicinal agents as the embodiment of forces, the question of the elective affinity of medicines becomes materially simplified, and crystallizes into a well-grounded theory.

The remainder of this paper shall now be devoted to a demonstration of the evidence for such a faith.

It is a fundamental law in nature that when two forces move in a similar direction they will enhance each other's movement and effects, and will cause them to move in the same channel. I think this phenomenon is nowhere more clearly and beautifully illustrated than it is in the domain of acoustics. A violinist, for example, in drawing his bow across any string on his instrument, can at the same time throw into vibration the corresponding string of a piano, while all the rest of the strings remain quiet and unaffected. This is called sympathetic vibration, but the reason why only one wire is thrown into vibration and the others remain at rest is just this: every string or wire in the piano is so conditioned that it is capable of producing only one rate of vibration, differing in this respect from all the other strings or wires in the instrument. A sound which is produced by a corresponding number of vibrations, although coming in contact with every string in the piano, is only capable of selecting and setting in motion that string the vibrations of which are similar to its own. A series of vibrations impinging themselves on such a string will produce motion in the latter, in obedience to the law that two similar forces moving in the same direction will reënforce each other, and in precisely the same manner as "if two clocks, for example, with pendulums of the same period of vibration, be placed against the same wall, and if one of the clocks is set going and the other not, the ticks of the moving clock, transmitted through the wall, will act on its neighbor. The quiescent pendulum, moved by a single tick, swings through an extremely minute arc, but it returns to the limit of its swing just in time to receive another impulse. By the continuance of this process, the impulses so add themselves together as finally to set the clock a-going. It is by this timing of impulses that a properly pitched voice can cause a glass to ring, and that the sound of an organ can break a particular window pane."*

This, I think, will serve to make clear the action of those

* Tyndall, "Sound," p. 398.

forces which have a corresponding relation of motion to the forces of the body. But it may be urged by some that while all I have said is perfectly true of the phenomena of sound, and of the laws of the inorganic world in general, yet there are no legitimate grounds on which to stand and apply these principles to physiology, or to organic nature. In defense of my position I can say that, aside of the truth that the operations of the laws of nature are the same everywhere, constantly during our working hours there are occurring vital phenomena which partake of precisely the same nature as those which I use as illustrations. For example, in the human ear there is an organ, discovered by the Marchese Corti, which according to Kölliker contains three thousand strings, and which bears a strong resemblance to a stringed instrument; and, in the opinion of many eminent physiologists and scientists, these pillars or rods of Corti, like the strings of a piano, are only thrown into vibration by those sound-waves which correspond to their own rate of vibration. Similarly with the eye, it is believed that luminous waves are only capable of affecting harmonious anatomical parts of this organ. And, when we say that the force which emanates from the combustion of the hydro-carbonaceous foods maintains muscular motion, we mean that there exists a complete harmony between the nature of such a force as that which is derived from the food and that which the muscular mechanism is capable of receiving and utilizing; or, when a consumptive patient regains his vigor and energy under the use of cod-liver oil, we have similar reasons for believing that this agent embodies a force which harmonizes with the vital forces. And I think we have plentiful evidence on every hand to convince any candid mind that the law of the aggregation of "likes," which has been so ably maintained and advocated by Herbert Spencer in his "First Principles," is universal—holds good for animate as well as inanimate nature.

So it is with a large number of our remedial agents, for there can no longer be any doubt that such therapeutic forces, like fat, alcohol, etc., which, in small quantities, move harmoniously with the bodily forces, thus manifest their elective affinity by a unity of action; but it must be understood that

such a principle of harmony does not explain the action of the forces which I propose to discuss in this paper, for all these move more or less antagonistically to the vital forces. Yet it is essential, in order to understand the latter, to properly apprehend the former mode of action.

The integrity of the body can only be maintained by the constant operation of many and diverse forces within itself, each force having its own particular duty to perform. This is precisely what the "physiological division of labor" implies, and an incidental antagonistic force introduced among so many different forces must produce widely varying results—disturbing some, and leaving others altogether untouched. If the bodily forces were all alike, and if the action of such a force were distributed equally throughout the body, they would naturally be all similarly affected. But it is evident that, if other things are equal, such a force will antagonize that force which shows the greatest opposition to it; and, since the bodily forces are unlike, some must offer greater resistance than others, and on those which manifest the greatest opposition the brunt of the blow must fall. Here, again, the laws of sound give us a fitting illustration of this phenomenon. It is well known that two sounds interfere with each other in proportion to the disparity which exists between them—a small difference causes a slight degree of interference or antagonism, and two diametrically opposite and equal sound-waves will annihilate each other and cause perfect silence. Thus, two sounds that differ but slightly in their rate of vibration will interfere with each other to such an extent as to produce the well-known phenomena of increase and decrease of loudness, which are called beats. Or, again, as Professor Tyndall says,* "two [tuning] forks may be so related to each other that one of them shall require a condensation at the place where the other requires a rarefaction; that the one fork shall urge the air-particles forward, while the other urges them backward. If the opposing forces be equal, particles so solicited will move neither backward nor forward, the aerial rest which corresponds to silence being the result. Thus, it

* "Sound," p. 357.

is possible, by adding the sound of one fork to that of another, to abolish the sounds of both."

Thus, then, when a discordant or antagonistic sound-wave meets a number or a body of such waves, its greatest disturbing effect falls on that particular wave with which it has the greatest disagreement or discordance; as, for example, the tone E flat, when produced simultaneously with the chord C E and G, will only interfere with the tone E, while the other two sounds suffer no disturbance whatever, merely because it forms an agreeable relation to those two sounds, and none at all to the tone E. This holds true throughout music, and is only an expression of the universal law that two forces interfere with each other in proportion to their unlikeness.

Now, I do not mean to illustrate by this that, when a therapeutic force antagonizes or interferes with a bodily force, like the wave-sounds, there must be a perfect correspondence in their mode of motion, and thus nicely fit into each other, as it were, but merely this, and this is all my argument requires, that the interference of the therapeutic with the bodily forces depends on the contrariety which occurs between them; that when such an antagonistic force is introduced into the body it is thrown into the midst of a large body of adverse forces with which it bears every shade of difference, and that its elective action falls on that bodily force which offers the greatest contrast to it.

Now, if, as we have seen, friction and mustard in their influence on the animal body can be so regulated as to produce either stimulation or disorganization, or, in other words, to promote health or cause disease in the structures of the body generally, it must also be true, then, that those agents which act on special tracts of tissue, or which counteract special bodily forces, can be so moderated as to yield the same effects on such special parts. In connection with this, it must be understood that, while these agents invariably in large doses disintegrate the bodily forces or structures, the disturbance in the latter manifests itself in varying characteristics, according to the structure affected. For example, those which tend to act on the muscular or more vascular structures will produce inflammation, and others which act on the nervous structures

will produce paralysis, etc. Thus, we find that strychnia in large doses paralyzes the spinal cord and its efferent or motor nerves, while in small doses it stimulates these structures. Atropia has the same effect in large doses on the vaso-motor nerves, and in small doses it stimulates these organs to healthy action. Copaiba and cantharides in large doses produce inflammation in different parts of the urinary mucous membrane, while in small doses they are used to combat this same disorder in these textures. No I might go on and multiply instances.

In a part of the body where the molecular activity is below the normal standard, it is an easy matter to conceive of the *modus operandi* of these therapeutic forces by which they accelerate molecular motion, and thus return the part to its healthy and former activity; but, since it is now well known that inflammation is a phenomenon of increased molecular activity itself, the question may here with perfect propriety be asked how it is possible to combat one mode of increased cell or molecular action by generating another! In answering this question, I repeat here almost in substance what I have said elsewhere* on this same subject: "We must always recollect that all disease is a process of disintegration, and inclines to diffuse and spread until met and counteracted by healthy molecular motion. It follows the law that motion takes place in the line of least resistance, and if the resistance is less on the side of health than it is on that of disease, then diseased molecular motion will spread, and *vice versa*; and, if there is not sufficient force present in the body, then death must inevitably follow. This resisting power varies in different individuals, and in the same individual in different periods, and it is well exemplified in the processes of mortification and gangrene, where the line of demarkation forms on the battleground between morbid and healthy molecular action. Indeed, this line may be fixing itself in a certain locality, and the strength of the patient be suddenly depressed still further, thus diminishing vital resistance, and allowing the line to settle still closer to the central part of the body. And again,

* "American Journal of Medical Sciences," July, 1877, p. 167.

a strong healthy subject is totally exempt from the invasion of any of these diseases under any circumstances, and it is only where there is found a vitiated state of the general or local health that such diseases prevail. The same conflict between healthy and diseased action is well witnessed in chronic ulcers, where the line between health and disease advances and recedes, making the ulcer appear large at one time and small at another, in direct correspondence with the strength of the patient, or of the part."

Now, then, if inflammation is in a quiescent state, i. e., neither extends nor diminishes its area, it is positive evidence that there exists an equilibrium between health and disease, and, if from any incidental cause the normal activity of the surrounding part is depressed, the balance becomes disturbed, and the disease consequently spreads. So precisely, on the contrary, if the molecular activity of the surrounding part is from any cause enhanced, the balance is likewise destroyed, and health extends its territory. In these therapeutic agents we have special elective forces wherewith we are able to enhance molecular activity in the surroundings of inflammatory action, and thus force the battle line into those parts which were formerly held by disease, and by the continuation of such a process we are not only able to prevent the spread of the disease, but even to eradicate it.

It must, I think, be evident, then, from what has been said, that any such agent, which has the power of producing physiological or toxic effects on any special force or structure of the body, must likewise affect the same force or structure therapeutically; for the relation between the motion of the drug on the one hand and that of the bodily forces on the other is the same under both conditions, the only difference being the result of the antagonism between the two; hence we find that certain agents, which produce toxic effects on certain structures in large doses, will prove curative in some diseases of these same structures in small doses, or doses in which they only display their stimulant property. This gives us an intelligent and rational notion of the value which physiological experiments with drugs upon the healthy animal system bear to therapeutics as guides in determining their elective

action, as well as their dose; and I hope it is needless for me to say here that such a principle of therapeutic action has no feature in common with the so-called law of *similars*.

Again, every organ in the body comprises a number of special parts or structures, and a therapeutic force may have an elective action on a part and not on the whole of the organ; hence it is obvious that, if a drug is not selected with a view or knowledge of this discriminative action, our remedial efforts must prove worse than useless; and I doubt not that a great many of our therapeutic failures are due to a want of proper appreciation of this single fact. Of this we possess a forcible example in the case of arsenic. This agent, as is well known, has a powerful stimulant and elective action on the skin, yet there is hardly a substance within the list of our remedies which has suffered greater misapplication in the treatment of skin diseases than arsenic. This abuse arises from the fact that not sufficient attention has been paid to its special elective action on the skin, for I think we have much reason for believing that it is where the cutaneous nerves are implicated only to a certain degree in the morbid action that the curative efficacy of arsenic is the most marked. Advisedly do I say that arsenic is only useful when there is slight, or what may perhaps be called functional, disturbance of the nerves of skin; for in herpes zoster and other similar affections, where there is often a visible structural change in the cutaneous nerves and in their main trunks, it is valueless, and stronger stimulant measures are required to bring about a cure.

We have already seen that the effect of a therapeutic force on the body is in proportion to its quantity as compared with that of the bodily forces with which it comes in contact. Now, if the bodily forces were of equal strength in every individual, it is apparent that the same effect would always follow a given quantity of any remedy; but since there are all shades of difference between different individuals, and even in the same individual under different circumstances, the quantity which would prove a stimulant to one person might be a depressant to another, or this might happen to the same individual at different periods. Hence it is very plain that the line

which divides the curative from the toxic effects of a drug varies, though it is sharp under different circumstances, and that great caution is necessary to obtain the former and to avoid the latter; and this leads me to say a few words concerning the important question of dosage, and what I do say here relates more particularly to the stimulant action of remedies, or to those which have the power of enhancing molecular action of the body.

The only aim, then, in the administration of such medicines is to secure the greatest possible amount of stimulation without engendering any of their toxic qualities, and, if what has been said is true, it is obvious that if we undertake to introduce the quantity of a medicine at a single dose, which has even proved a stimulant dose in a number of cases, we run the risk of producing undesirable results in individual patients. Therefore by far the safest and most successful method in the majority of cases is to give a small and oft-repeated dose, continue it until the full stimulant effects are secured, and then withdraw it, or give it at longer intervals. Another and perhaps a more important reason for a minimum dose is this: a dose which has no influence whatever on the healthy system can yet produce toxic effects in disease, for, if all things are equal, the body or any of its structures when diseased is weaker, has less resistance, and hence is much more readily overwhelmed by an aggressive force than in health. Of course this is a rule which can not be followed at all times without deviation, for in certain emergencies—as in great pain, for example—it is necessary and also justifiable to resort to large doses even at the risk of producing toxic symptoms; but, where there is no great urgency for immediate relief, the above method is the only scientific and rational plan of medication, and in this way we gain, as Ringer says, the maximum effect of a minimum dose. One thing, however, must be borne in mind, that, as a rule, the older or more chronic the disease the larger must be the dose to eradicate it, or the longer will be the time required to make an impression on it, for a chronic disease is more firmly located in a tissue than an acute one, and thus offers more protracted resistance to an attacking force.

The following cases are herewith presented in order to illustrate the foregoing principles of therapeutic action in a practical light. They have all been selected from regions of the body where the nature of the disease could not be mistaken, and where the result of treatment was readily perceived. They will be related in as condensed a form as is consistent with their intelligible comprehension, and comments will be made wherever necessary.

CASE I. *Tincture of Aloes in Prolapsus Ani.*—Saw J. G., aged two years and five months, first on August 5, 1878. She was then suffering from prolapsus ani and diarrhoea. The diarrhoea yielded readily to ordinary remedies, but the bowel protruded as before. I ordered the mother to wash the prolapsed rectum with a decoction of tannic acid, which she faithfully carried out until August 19th, when I saw the child again. There was no improvement. I now gave her drop doses of tincture of nux vomica every three hours, which was continued for more than a week without any perceptible alteration. On September 2d, I began to treat her with drop doses of tincture of aloes every two hours, with marked benefit in the course of two days. She continued to improve under the medicine, the bowel returned to its normal condition and remained so.

Remarks.—It is hardly incumbent on me to say anything concerning the therapeutic action of aloes, for it is well known to have a special affinity for the lower portion of the alimentary tract. Wedekind and Phillips hold the opinion, which was confirmed by the researches of Rutherford and Vignal, that it also possesses a cholagogue action. In the above case, however, it was not employed with a view of obtaining its hepatic action, but principally for its influence on the lower bowel, and I think that it has, in the manner above indicated, conferred a healthy tone on the relaxed muscular coat of the rectum. Not every case of prolapsus ani, however, can be intrusted to the curative action of aloes, but I think its failure can be accounted for from the fact that the relaxation of the bowel extends further up than its own influence, and such cases often yield to its combination with nux vomica, or to the latter alone, whose sphere of decided action at least reaches

above that of aloes. I think the reason for the shortcoming of nux vomica in this case was due to the fact that the lesion was principally confined to the extremity of the bowel. That nux vomica will not fail when the proper conditions are present is evident from the following case:

CASE II. *Tincture of Nux Vomica in Prolapsus Ani.*—D. S., aged two years and four months, became subject to diarrhœa in the early part of the present summer, and I was summoned to see her August 20, 1878. The number of stools amounted to as many as five and six during the day, and also became somewhat bloody. I treated her with opium, ipecacuanha, magnesia, and tannin, without much decided benefit to the diarrhœa, and to complicate matters the bowel began to protrude. On September 1st, I began to treat her with half-drop doses of tincture of nux vomica every half hour, and in a few days both the diarrhœa and the prolapsus improved. In a few days after the bowel was well and the diarrhœa had ceased, the medicine was neglected, and the mother fed the child with some apples, which brought on both disorders again. Ordered the medicine to be renewed, and with the same beneficial result as before.

October 7th.—Continues well.

Remarks.—In nux vomica we find an agent which has an undoubted action on the nerves of the intestinal canal, and in this manner influences its muscular coat, and we have reason for believing, from the persistent irritation and diarrhœa, that that part of the alimentary canal which is comprised by the large bowel was involved in this case. Aloes would certainly have had a beneficial action on the rectum, but it is exceedingly improbable that it would have relieved the whole trouble.

CASE III. *Tincture of Cantharides in Irritable Bladder.*—Mrs. P., aged about twenty-seven, primipara, pregnant about four months and a half, consulted me September 15, 1878, on account of an incessant pain in the region of the bladder, accompanied by a continuous desire to pass water. She says that she is compelled to get up as often as a dozen times during one night to urinate, and that she is in misery both day and night. She refers her pain directly to the neck

of the bladder. I gave her morphia, bicarbonate of soda, etc., and applied hot flaxseed poultices to the seat of pain without any decided relief. On the morning of September 27th, I began to give her drop doses of tincture of cantharides in a teaspoonful of water every hour and a half. She soon began to improve, and the following night she only passed water twice. Last night (September 28th) she only urinated once. The pain and irritability subsided altogether under the influence of the medicine.

CASE IV. *Tincture of Cantharides in Incontinence of Urine.*—W. R. (October 11, 1878), aged four years, has been troubled with incontinence of urine for the last two or three months, his water escaping almost every night. Gave him one drop of tincture of cantharides morning and evening with great relief.

Remarks.—Among the specific effects of cantharides is its action on the mucous membrane of the urinary passages, especially on the bladder and its neck—causing violent tenesmus and strangury in that organ in large doses. In Case III., it undoubtedly removed the existing irritability in the bladder by the method which we saw such agents possess in relieving inflammation (for irritability is but removed a step from inflammation) by well-regulated stimulation. In Case IV., this agent, by its stimulant action, infused a more healthy tone into the contractile structure of the neck of the bladder, and thus enabled it to prevent any further involuntary escape of the urine.

CASE V. *Fluid Extract of Bryonia in Subacute Pleurisy.*—On September 2, 1878, I was called in to see T. D., aged fifty-five, who suffered with a severe and sharp lancinating pain in both sides of the chest. He is unable to take a long breath on account of the intense pain which is occasioned by such an act. Pulse, 110. Skin hot and dry. I learn that some years ago he was subject to what he calls pleurisy, and on examination I find pleural friction in both mammary regions of the chest. I applied a tight bandage around his chest, and gave him one drop of fluid extract of bryonia every half hour in half a teaspoonful of water.

September 3d.—Saw the patient again this morning, and

found his condition very much improved. He is now able to sit up in bed, and can take a long breath without much inconvenience. Continued same treatment.

4th.—Discharged him. I also ordered him to take plenty of milk and other nourishing fluid food.

Remarks.—It is well attested by all those who have made physiological experiments, or who have used it therapeutically, that bryonia has a marked specific action on the serous membranes of the body, notably so on the pleural surfaces. Phillips says that it will cause “fatal pleurisy with fibrinous effusion”; and of its therapeutic value he says that in pericarditis and pleurisy “it fully equals any remedy that exists.” Hughes says that “no poison affects the serous membranes so certainly and powerfully as bryonia.” I have seen similar excellent results in other cases of pleurisy, as well as in peritonitis, although my observation leads me to think that it is perhaps more efficacious in the former than in the latter disease.

CASE VI. *Fluid Extract of Podophyllin in Clayey Stools of Infantile Diarrhœa.*—To-day (September 1, 1878) I saw T. D., aged fifteen months, a convalescent from a severe attack of cholera infantum, who is still subject to diarrhœa. His evacuations number about five or six during the twenty-four hours, and are of a grayish-white color, resembling light clay. His diet consists of milk, barley-water, beef-tea, and cod-liver-oil emulsion. He is very much emaciated. I gave him half-drop doses of fluid extract of podophyllin every two hours in half a teaspoonful of water. Saw him again on September 3d, and the mother reports that his stools are changed to a more healthy color and consistency, and that he has only had three stools within the last forty hours.

September 6th.—Still improving.

12th.—Discharged well.

Remarks.—I think there can be no doubt that the clayey stools of this patient were the result of an inactive liver, and that as soon as the podophyllin, which is now well known to be a powerful cholagogue, stimulated this organ to its wonted activity, the stools assumed their healthy color and consistency.

CASE VII. *Fluid Extract of Hamamelis in Internal Hemorrhoids.*—E. W., miner, aged —, came to me on the

morning of October 16, 1878, and consulted me concerning bleeding piles, which have troubled him off and on for seven years. He had been under my care before for the same disease. He says he is in great pain, which extends from the anus up on the left side of the spine as far as the top of the pelvis, and that he loses as much as half a teacupful of blood at each evacuation of the bowel. He looks haggard, and walks in a stooped position, saying that he can not stand erect on account of the pain in his back. Gave him one drop of fluid extract of hamamelis every hour in half a teaspoonful of water.

October 17th.—Saw him again, and he reports that he is somewhat better; the pain in the back is relieved very much, but he still loses some blood at stool. The hæmorrhage is not so profuse, however, as it was before he took the medicine. Continued same treatment.

18th.—He now reports himself improved in every way; less blood in stools, and no pain at all in the back.

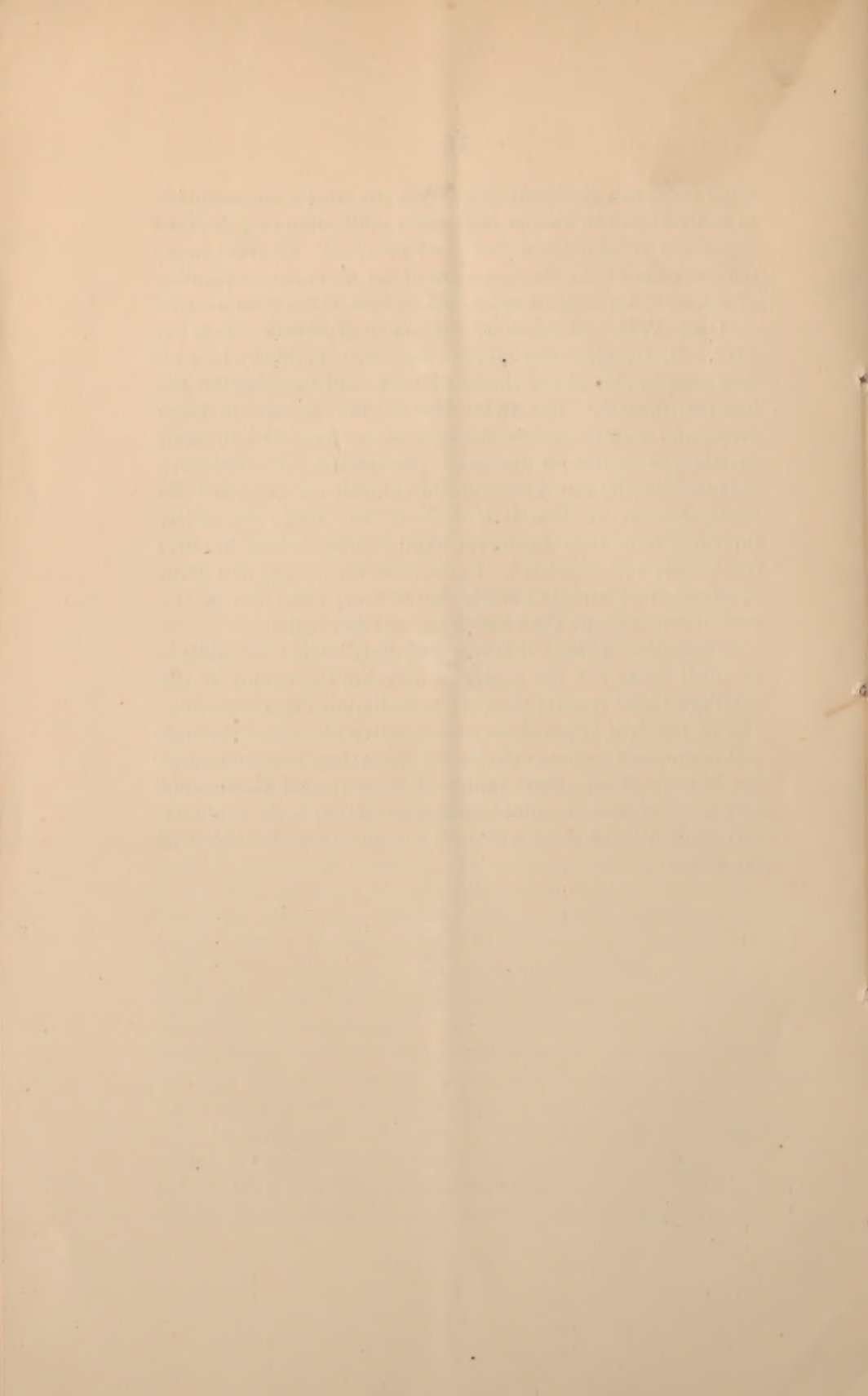
19th.—He is well, and says that he never got over any attack so quick as he did at this time.

Remarks.—This American remedy controls the vascular mechanism in a manner similar to digitalis, its action, however, being confined more exclusively to the venous circulation. Dr. Ringer says: "It is very highly recommended in piles, both to check bleeding and to cure the diseased veins; and I have found it singularly successful and prompt in arresting this form of bleeding, even when amounting to half a pint a day, repeated almost daily for months or years. It should be employed either as a lotion, injection, or cerate in piles, as well as by the mouth. It has been recommended in varicocele; and one case I have seen in which, during the employment of this drug, the varicosities entirely and apparently permanently disappeared." My excellent friend Dr. E. R. Mayer, in his essay on "Specific Medication," says that "*Hamamelis Virginica* certainly has a specific action upon the venous system, and is, independently of its content of tannic acid, an astringent and tonic to weakened, engorged, and dilated veins, to venous sinuses or capillaries, and a rarely failing remedy for all the passive hæmorrhages. . . . In bleeding piles its good effects are most marked. Its continued use in

small doses will also frequently cause the largest hæmorrhoids to contract and to disappear, if great infiltration and thickening of the cellular tissue have not occurred. In these cases, the local use of the decoction, or of an ointment or poultice of the medicine, adds much to the success of the treatment."

CASE VIII. *Sulphate of Atropia in Hydrosis.*—*July 31, 1877.*—G. L., aged nine months, has been troubled with profuse perspiration about the head, neck, and shoulders for the last two months. The sweat is cold and appears in large drops, and mostly occurs during sleep or upon the slightest exertion, as crying, for instance. The sweating is so excessive that she literally saturates everything under her head, and the nurse informs me that it is necessary to change the pillow three and four times during one night in order to keep her dry. She is pale and emaciated. I prescribed for her $\frac{1}{300}$ of a grain of sulphate of atropia once a day or every other day as the case demanded, and the sweating ceased forthwith.

Remarks.—I think it is now definitely settled that atropia in small doses has the power of reducing the caliber of the capillary blood-vessels; and, by thus diminishing the circulation of the skin, it promotes a more active blood-flow through this organ, and restrains the loss of the watery constituents of the blood. Many other similar cases of special therapeutic action in diseases of other structures of the body could be given, but I think these will suffice to illustrate the object of my paper.



INTERNATIONAL SCIENTIFIC SERIES.

NOW READY.

- NO. 1. **FORMS OF WATER**, in Clouds, Rain, Rivers, Ice, and Glaciers. By Prof. JOHN TYNDALL, LL. D., F.R.S. 1 vol. Cloth. Price, \$1.50.
2. **PHYSICS AND POLITICS**; or, Thoughts on the Application of the Principles of "Natural Selection" and "Inheritance" to Political Society. By WALTER BAGSHOT, Esq., author of "The English Constitution." 1 vol. Cloth. Price, \$1.50.
3. **FOODS**. By EDWARD SMITH, M.D., LL.B., F.R.S. 1 vol. Cloth. Price, \$1.75.
4. **MIND AND BODY**. The Theories of their Relations. By ALEX. BAIN, LL. D., Professor of Logic in the University of Aberdeen. 1 vol., 12mo. Cloth. Price, \$1.50.
5. **THE STUDY OF SOCIOLOGY**. By HERBERT SPENCER. 1 vol., 12mo. Cloth. Price, \$1.50.
6. **THE NEW CHEMISTRY**. By Prof. JOSIAH P. COOKE, JR., of Harvard University. 1 vol., 12mo. Cloth. Price, \$2.00.
7. **THE CONSERVATION OF ENERGY**. By Prof. BALFOUR STEWART, LL. D., F.R.S. 1 vol., 12mo. Cloth. Price, \$1.50.
8. **ANIMAL LOCOMOTION**; or, Walking, Swimming, and Flying, with a Dissertation on Aeronautics. By J. BELL PEITZGREW, M.D., F.R.S., F.R.S.E., F.R.C.P.E. 1 vol., 12mo. Fully illustrated. Price, \$1.75.
9. **RESPONSIBILITY IN MENTAL DISEASE**. By HENRY MAUDSLAY, M.D. 1 vol., 12mo. Cloth. Price, \$1.50.
10. **THE SCIENCE OF LAW**. By Prof. SHEDDEN ANOES. 1 vol., 12mo. Cloth. Price, \$1.75.
11. **ANIMAL MECHANISM**. A Treatise on Terrestrial and Aerial Locomotion. By E. J. MARRY. With 117 Illustrations. Price, \$1.75.
12. **THE HISTORY OF THE CONFLICT BETWEEN RELIGION AND SCIENCE**. By JOHN WM. DRAPER, M.D., LL.D., author of "The Intellectual Development of Europe." Price, \$1.75.
13. **THE DOCTRINE OF DESCENT, AND DARWINISM**. By Prof. OSCAR SCHMIDT, Strasbourg University. Price, \$1.50.
14. **THE CHEMISTRY OF LIGHT AND PHOTOGRAPHY**. In its Application to Art, Science, and Industry. By Dr. HERMANN VOGEL. 100 Illustrations. Price, \$2.00.
15. **FUNGI**; their Nature, Influence, and Uses. By M. C. COOKE, M.A., LL.D. Edited by Rev. M. J. BEKKERLY, M.A., F.L.S. With 109 Illustrations. Price, \$1.50.
16. **THE LIFE AND GROWTH OF LANGUAGE**. By Prof. W. D. WHITNEY, of Yale College. Price, \$1.50.
17. **MONEY AND THE MECHANISM OF EXCHANGE**. By W. STANLEY JEVONS, M.A., F.R.S., Professor of Logic and Political Economy in the Owens College, Manchester. Price, \$1.75.
18. **THE NATURE OF LIGHT**, with a General Account of Physical Optics. By Dr. EUGENE LOMMEL, Professor of Physics in the University of Erlangen. With 188 Illustrations and a Plate of Spectra in Chromolithography. Price, \$2.00.
19. **ANIMAL PARASITES AND MESSMATES**. By Monsieur VAN BENDEN, Professor of the University of Louvain, Correspondent of the Institute of France. With 83 Illustrations. Price \$1.50.
20. **ON FERMENTATIONS**. By P. SCHÜTZENBERGER, Director at the Chemical Laboratory at the Sorbonne. With 29 Illustrations. Price, \$1.50.
21. **THE FIVE SENSES OF MAN**. By JULIUS BERNSTEIN, O. Ö. Professor of Physiology in the University of Halle. With 91 Illustrations. Price, \$1.75.
22. **THE THEORY OF SOUND IN ITS RELATION TO MUSIC**. By Prof. PIETRO BLASERNA, of the Royal University of Rome. With numerous Woodcuts. 1 vol., 12mo. Cloth. Price, \$1.50.

PROSPECTUS.

D. APPLETON & Co. have the pleasure of announcing that they have made arrangements for publishing, and have recently commenced the issue of a SERIES OF POPULAR MONOGRAPHS, or small works, under the above title, which will embody the results of recent inquiry in the most interesting departments of advancing science.

The character and scope of this series will be best indicated by a reference to the names and subjects included in the subjoined list, from which it will be seen that the co-operation of the most distinguished professors in England, Germany, France, and the United States, has been secured, and negotiations are pending for contributions from other eminent scientific writers.

The works will be issued simultaneously in New York, London, Paris, Leipzig, Milan, and St. Petersburg.

The INTERNATIONAL SCIENTIFIC SERIES is entirely an American project, and was originated and organized by Dr. E. L. YOUNG, who spent the greater part of a year in Europe, arranging with authors and publishers. The forthcoming volumes are as follows:

Prof. W. KINGDON CLIFFORD, M.A., *The First Principles of the Exact Sciences explained to the Non-Mathematical*.
 Prof. T. H. HUXLEY, LL.D., F.R.S., *Bodily Motion and Consciousness*.
 Dr. W. B. CARPENTER, LL.D., F.R.S., *The Physical Geography of the Sea*.
 Prof. Wm. ODLING, F.R.S., *The Old Chemistry viewed from the New Stand-point*.
 W. LAUDER LINDSAY, M.D., F.R.S.E., *Mind in the Lower Animals*.
 Sir JOHN LEBROCK, Bart., F.R.S., *On Jute and Bees*.
 Prof. W. T. THIMELTON DYER, B.A., B.Sc., *Form and Habit in Flowering Plants*.
 Mr. J. N. LOCKYER, F.R.S., *Spectram Analysis*.
 Prof. MICHAEL FOSTER, M.D., *Protoplasm and the Cell Theory*.
 H. CHARLTON BASTIAN, M.D., F.R.S., *The Brain as an Organ of Mind*.
 Prof. A. C. RAMSAY, LL.D., F.R.S., *Earth Sculpture; Hills, Valleys, Mountains, Plains, Rivers, Lakes; how they were produced, and how they have been destroyed*.
 Prof. RICHARD VINCOW (Berlin University), *Morbid Physiological Action*.
 Prof. CLAUDE BERNARD, *Hisory of the Theories of Life*.
 Prof. H. SAINT-CLAIRE DEVILLE, *An Introduction to General Chemistry*.
 Prof. WUNST, *Atoms and the Atomic Theory*.
 Prof. DE QUATREFAGES, *The Human Race*.
 Prof. LACAZE-DUTHIERS, *Zoology since Cuvier*.
 Prof. BERTHELOT, *Chemical Synthesis*.
 Prof. C. A. YOUNG, Ph.D. (of Dartmouth College), *The Sun*.
 Prof. ORDEN N. ROOP (Columbia College, New York), *Modern Chromatics and its Relations to Art and Industry*.

Dr. EUGENE LOMMEL (University of Erlangen), *The Nature of Light*.
 Prof. J. ROSENTHAL, *General Physiology of Muscles and Nerves*.
 Prof. JAMES D. DANA, M.A., LL.D., *On Cephalization; or, Head-Characters in the Gradation and Progress of Life*.
 Prof. S. W. JOHNSON, M.A., *On the Nutrition of Plants*.
 Prof. AUGUST FLINT, Jr., M.D., *The Nervous System, and its Relation to the Bodily Functions*.
 Prof. BERNSTEIN (University of Halle), *The Five Senses of Man*.
 Prof. FERDINAND COHN (Breslau University), *Thallophytes (Algae, Lichens, Fungi)*.
 Prof. HERMANN (University of Zurich), *On Respiration*.
 Prof. LEUCKART (University of Leipzig), *Outlines of Animal Organization*.
 Prof. LIEBEICH (University of Berlin), *Outlines of Toxicology*.
 Prof. KUNDT (University of Strasbourg), *On Sound*.
 Prof. REES (University of Erlangen), *On Parasitic Plants*.
 Prof. STEINTHAL (University of Berlin), *Outlines of the Science of Language*.
 P. BERT (Professor of Physiology, Paris), *Forms of Life and other General Considerations*.
 E. AIGLAVE (Professor of Constitutional and Administrative Law at Douai, and of Political Economy at Lille), *The Primitive Elements of Political Constitutions*.
 P. LORAIN (Professor of Medicine, Paris), *Modern Epidemics*.
 Prof. SCHEFFENBERGER (Director of the Chemical Laboratory at the Sorbonne), *On Fermentations*.
 MORE FRIEDEL, *The Functions of Organs: Chemistry*.
 MORE DERRAY, *Precious Metals*.
 Prof. CORFIELD, M.A., M.D. (Oxon.), *Air in its Relation to Health*.
 Prof. A. GIARD, *General Embryology*.

D. APPLETON & CO., Publishers, 549 & 551 Broadway, N. Y.

TO THE MEDICAL PROFESSION

WE beg to call your attention to the
NEW YORK MEDICAL JOURNAL. In doing so, we can
say with confidence that this journal occupies a higher
place in medical literature than any other monthly pub-
lication in this country, and that henceforth no effort
will be spared to enhance its value, and render it indis-
pensable to every practitioner who desires to keep up
with the times. Trusting you will favor us with your
support,

We are, yours truly,

D. APPLETON & CO.

The foremost American Monthly.

THE NEW YORK MEDICAL JOURNAL,

Edited by JAMES B. HUNTER, M. D.,

Surgeon to the New York State Woman's Hospital; Consulting Surgeon to the New York
Infirmary for Women and Children; Member of the New York Obstetrical Society, etc.

The leading features of this Journal are the following:

ORIGINAL COMMUNICATIONS FROM EMINENT MEMBERS OF THE PROFESSION.

REPORTS OF INTERESTING CASES IN PRIVATE PRACTICE.

NOTES OF PRACTICE IN METROPOLITAN HOSPITALS, ILLUSTRATING THE USE OF NEW
METHODS AND NEW REMEDIES.

TRANSLATIONS AND EXTRACTS GIVING THE CREAM OF ALL THE FOREIGN JOURNALS.

REPORTS ON MEDICINE, SURGERY, OBSTETRICS, GYNÆCOLOGY, LARYNGOLOGY, PATHOLOGY, etc.

CRITICAL AND IMPARTIAL REVIEWS OF ALL NEW MEDICAL BOOKS.

PROCEEDINGS OF MEDICAL SOCIETIES.

COPIOUS ILLUSTRATIONS BY MEANS OF WOODCUTS.

THE LATEST GENERAL MEDICAL INTELLIGENCE.

A new volume of the NEW YORK MEDICAL JOURNAL begins with the numbers for
January and July each year. Subscriptions received for any period.

Terms, \$4.00 per Annum, postage prepaid by the Publishers.

Trial Subscriptions will be received at the following rates: Three months, \$1.00; six
months, \$2.00; specimen copy, 25 cents.

A General Index to the NEW YORK MEDICAL JOURNAL, from its first issue to June,
1876—including twenty-three volumes—now ready. Price, in cloth, 75 cents, post-paid.

Remittances, invariably in advance, should be made to

D. APPLETON & CO., Publishers, 549 & 551 Broadway, N. Y.